



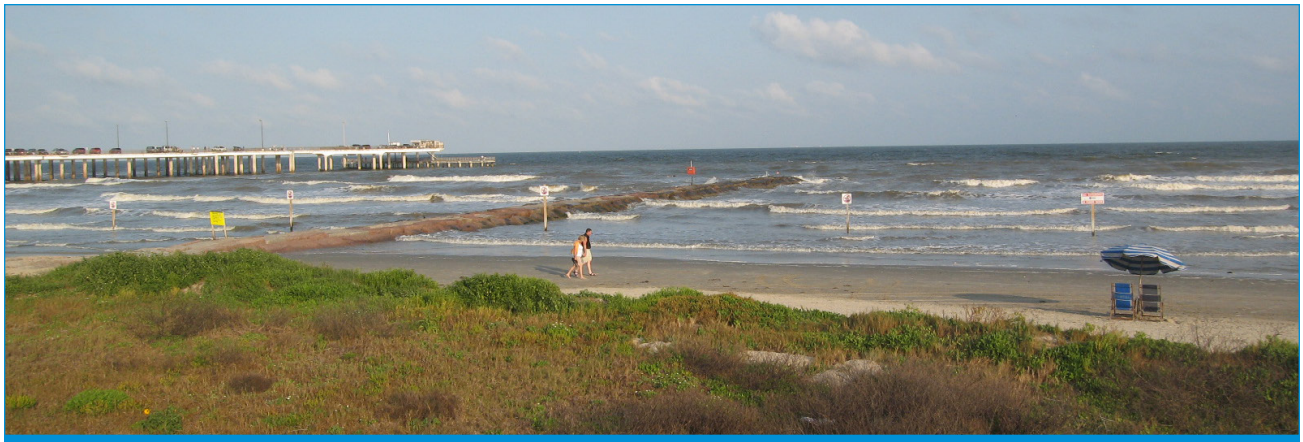


COASTAL EROSION PLANNING & RESPONSE ACT

A REPORT TO THE 84TH TEXAS LEGISLATURE

Texas General Land Office

George P. Bush, Commissioner



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LIST OF ACRONYMS

BEG
The University of Texas at Austin
Bureau of Economic Geology

BMMP
Beach Monitoring and Maintenance Plan

BUDM
Beneficial Use of Dredged Materials

CBBEP
Coastal Bend Bays and Estuaries Program

CEPRA
Coastal Erosion Planning and Response Act

CCAC
Coastal Coordination Advisory Committee

CELCP
Coastal and Estuarine Land Conservation Program

ERP
Erosion Response Plan

FEMA
Federal Emergency Management Agency

GIWW
Gulf Intracoastal Waterway

GLO
Texas General Land Office

NWR
National Wildlife Refuge

OBA
Texas Open Beaches Act

SPI
South Padre Island

INTRODUCTION

Texas has 367 miles of gulf-facing shoreline and approximately 3,300 miles of bay shoreline. The Texas coast has some of the highest coastal erosion rates in the country with some locations losing more than 55 feet per year. On average the Texas coast is eroding at 4.0 feet per year.

Coastal erosion results in the loss of property, which may reduce property values and reduce tourism in local communities. In addition, erosion results in the loss of beaches, dunes, and wetlands, which reduce impacts to coastal communities from tropical storms and hurricanes. Other coastal resources impacted by coastal erosion include the Gulf Intracoastal Waterway (GIWW), ports and ship channels, petrochemical facilities, road infrastructure, and other types of commercial businesses.

The Coastal Erosion Planning and Response Act (CEPRA) was enacted on September 1, 1999, during the 76th Legislature. The General Land Office (GLO) Coastal Resources Division administers the CEPRA program with a goal to reduce impacts to valuable coastal resources caused by coastal erosion.

Beginning in 1999, the CEPRA program has been administered during seven cycles. Each cycle consists of a two-year period and coincides with the legislative biennium. Funding appropriated within the biennium must be encumbered and spent on projects within the biennium unless funding for a particular project is given "carryover" authority by the Legislature. Historically, "carryover" authority has been given to projects involving construction that are not anticipated to be completed within the biennium.

Moses Lake before the project.

The CEPRA program partners with other state, federal, and local governments, as well as nonprofit organizations to develop and fund coastal erosion projects. According to Texas Natural Resources Code, §33.603(e), beach nourishment projects require at least 25 percent match funding while other coastal erosion response studies or projects require at least 40 percent match funding.

Moses Lake after the project.

In addition to meeting minimum match funding requirements, the CEPRA program consistently leverages additional funding through other funding sources such as grants. During the Cycle 8 biennium, $14,026,070 of CEPRA funding was leveraged to obtain $27,349,977 in match funding for a total of $41,376,046 in project funds.

The CEPRA program administers a wide variety of coastal projects to reduce impacts from coastal erosion. These projects include alternative analyses to evaluate different erosion response methods, engineering design of preferred methods, and beach and dune restoration; habitat restoration of coastal wetlands; shoreline protection using hard and soft techniques; scientific studies to collect data in support of the program; structure removal assistance and debris removal; and other projects that continue to promote sound coastal stewardship.

In addition to coastal erosion, the CEPRA program must address other challenges including relative sea level rise, impacts from tropical storms and hurricanes, and the Severance v. Patterson lawsuit. The rate of relative sea level rise along the western coast of the Gulf of Mexico is substantially faster than the global trend, primarily due to land subsidence. CEPRA project teams must anticipate these changes in relative sea level rise when designing coastal projects. Approximately three hurricanes impact the Texas coast every four years, increasing erosion and damaging CEPRA projects (Roth, 2010).

South Padre Island beach.

The Severance v. Patterson lawsuit challenged the public easement defined under the Texas Open Beaches Act. CEPRA projects are funded through public funds and therefore cannot be constructed in areas that are not accessible to the public through a public easement.

This report contains Cycle 8 highlights including critical erosion areas, proposed projects, funded projects, financial status of the CEPRA program, and an estimated cost to fund needs during the next CEPRA cycle. These reporting requirements are in accordance with Texas Natural Resources Code §33.608.

CURRENT AND HISTORICAL FUNDING OF THE CEPRA PROGRAM

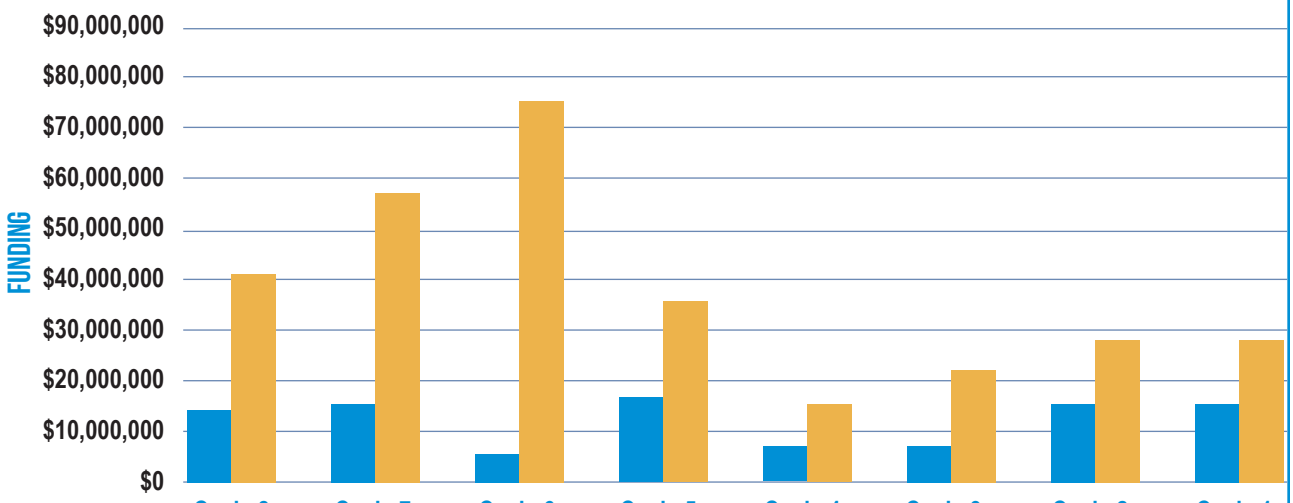
The 83rd Legislature appropriated $22,467,920 to the GLO to administer coastal programs. This appropriation was used in part to fund Cycle 8 projects and studies under CEPRA. Cycle 8 covers the period from September 1, 2013 to August 31, 2015. The Coastal Projects in the Cycle 8 Biennium section describes the projects and studies that are underway at this time. The funding was also leveraged against $27,349,977 of matching funds from federal and other local sources.

SUMMARY OF CEPRA FUNDING ALLOCATIONS BY CYCLE

Funding Cycle	No. of Projects Funded	CEPRA Funding	Partner Match	Federal Leverage	Other State/Local Leverage	Total Budget for Cycle
8 (FY14 - 15)	21	$14,026,070	$11,387,346	$15,962,631	$0	$41,376,046
7 (FY12 - 13)	26	$15,256,290	$2,287,965	$39,684,330	$0	$57,228,585
6 (FY10 - 11)	28	$5,463,806	$13,090,187	$55,824,351	$0	$74,378,344
5 (FY08 - 09)	59	$17,822,687	$5,460,873	$12,866,313	$0	$36,149,873
4 (FY06 - 07)	49	$7,300,000	$2,035,616	$6,466,752	$0	$15,802,368
3 (FY04 - 05)	48	$7,320,000	$2,104,390	$12,862,988	$93,500	$22,380,878
2 (FY02 - 03)	63	$15,000,000	$5,732,233	$6,991,532	$0	$27,723,765
1 (FY00 - 01)	43	$15,000,000	$6,316,995	$6,059,267	$595,680	$27,971,942

Note: Cycle 8 appropriations were $22,467,920, Cycle 5, 6, and 7 appropriations were $25M, $25.2M, and $22.5M respectively. These funds were provided to administer coastal programs which include, but are not limited to, projects under the CEPRA program. Cycle 6 appropriations were reduced to comply with the mandatory legislative budget reduction. Additionally, GLO management decided to make further reductions and return additional funds to the Legislature in order to assist with the statewide budget deficit.

COMPARISON OF CEPRA FUNDING TO TOTAL BUDGET BY CYCLE



	Cycle 8	Cycle 7	Cycle 6	Cycle 5	Cycle 4	Cycle 3	Cycle 2	Cycle 1
CEPRA	$14,026,070	$15,256,290	$5,463,806	$17,822,687	$7,300,000	$7,320,000	$15,000,000	$15,000,000
TOTAL BUDGET	$41,376,046	$57,228,585	$74,378,344	$36,149,873	$15,802,368	$22,380,878	$27,723,765	$27,971,942

CEPRA FUNDING APPROPRIATIONS FOR EACH BIENNIUM

Biennium	State Funding	Source	Matching Funds Completed	Number of Projects Requested	Number of Projects	Funding Requests
2000-2001 Cycle 1	$15M	General Revenue & General Revenue Dedicated Funds (CPF)	$12,971,942	42	63	$129,171,116
2002-2003 Cycle 2	$15M	General Revenue & General Revenue Dedicated Funds (CPF)	$12,723,765	53	64	$108,221,545
2004-2005 Cycle 3	$25M	General Revenue Dedicated Funds (CPF)	$15,060,878	20	77	$36,498,859
2006-2007 Cycle 4	$15M	General Revenue Dedicated Funds (CPF)	$8,502,368	49	81	$111,780,028
2008-2009 Cycle 5	$25M	Sales Tax on Sporting Goods (MOU with Parks and Wildlife)	$18,327,186	59	84	$58,057,437
2010-2011 Cycle 6	$25.2M	Sales Tax on Sporting Goods (MOU with Parks and Wildlife)	$76,957,155	32	62	$78,876,876
2012-2013 Cycle 7	$22.5M	Sales Tax on Sporting Goods (MOU with Parks and Wildlife)	$41,972,295	26	43	$97,200,241
2014-2015 Cycle 8	$22.5M	Sales Tax on Sporting Goods (MOU with Parks and Wildlife)	$27,349,977	21	34	$41,376,047
	Totals		$213,865,566	302	508	$661,182,149

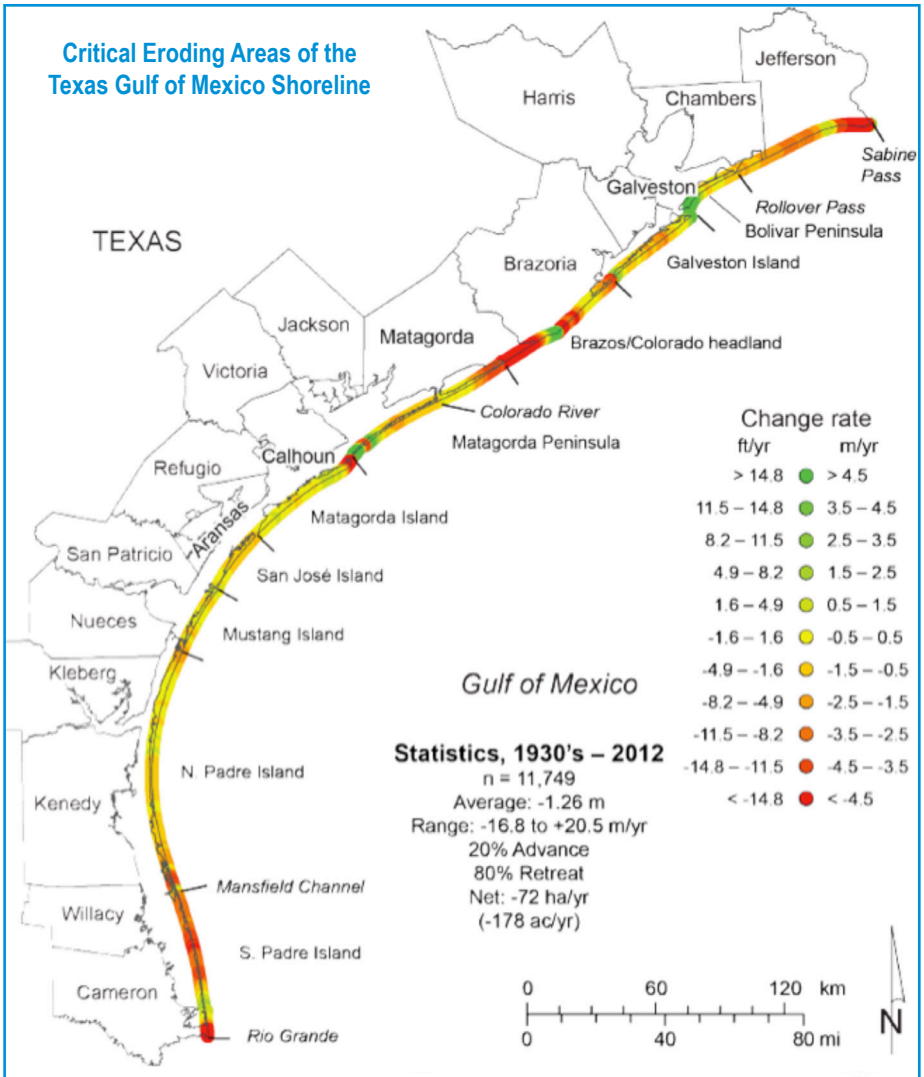
CRITICAL ERODING AREAS OF THE GULF COAST

Eroding Areas of the Texas Gulf Coast

The 367 miles of the Texas gulf-facing shoreline is predominantly composed of low-elevation sandy beaches that are part of numerous long, narrow barrier island complexes, barrier peninsulas, and delta headlands. Behind these gulf-facing shores, an additional 3,300 miles of bay shorelines surround the many bays and estuaries that formed near the mouths of river systems. The majority of these gulf and bay shorelines are retreating due to coastal erosion.

Texas Natural Resources Code §33.601 defines coastal erosion as:

"The loss of land, marshes, wetlands, beaches, or other coastal features within the coastal zone because of the actions of wind, waves, tides, storm surges, subsidence, or other forces."



Rates greater than two feet per year are shown in red, and stable or accreting (gaining land) areas are shown in black. Data were compiled from historical erosion rates determined by the University of Texas BEG.

The GLO Rules for Management of the Beach/Dune System (31 TAC §15.2 [31]) define a critically eroding area as a portion of the shoreline that is experiencing a historical erosion rate of greater than two feet per year based on published data of the University of Texas Bureau of Economic Geology (BEG). Section 33.601(4) of the Natural Resources Code defines a critical coastal erosion area as:

"A coastal area that is experiencing historical erosion, according to the most recently published data of the BEG, which the Commissioner finds to be a threat to:

- Public health, safety or welfare;
- Public beach use or access;
- General recreation;
- Traffic safety;
- Public property or infrastructure;
- Private commercial or residential property;
- Fish or wildlife habitat; and
- An area of regional or national importance."

The map on page 5 and the table below illustrate the distribution and extent of critically eroding areas of the Texas coast. Eighty-four percent of the Texas gulf shoreline is retreating with a coastwide average rate of retreat of approximately four feet per year, with some extreme areas losing as much as 55 feet per year. Sixty-one percent of the Texas gulf shoreline is classified as critically eroding where the rate of shoreline retreat is greater than two feet per year. The areas experiencing the highest erosion rates in Texas are located along the upper Texas coast from Matagorda County northward, and on the lower Texas coast along South Padre Island in Willacy and Cameron counties. On average, 235 acres of land along the Texas Gulf Coast and the state's bays, estuaries, and navigation channels are lost each year to erosion.

MILES OF CRITICALLY ERODING SHORELINE ON THE TEXAS COAST*

Region	Total Coastal Miles	Critical Eroding Miles	Percent Eroding Shoreline
1-Sabine Pass to Bolivar Roads (Galveston County)	59.0	47.6	80.6%
2-Bolivar Roads to San Luis Pass	29.0	13.9	48.1%
3-San Luis Pass to Old Colorado River	63.1	45.6	72.3%
4-Old Colorado River to Aransas Pass	83.7	45.3	54.1%
5-Aransas Pass to Padre Island National Seashore	27.3	11.3	41.4%
6-Padre Island National Seashore to Mansfield Cut	64.1	29.2	45.5%
7-Mansfield Cut to Rio Grande River/U.S. Border	40.8	32.1	78.6%
Total	367.0	224.9	61.3%

** As determined from average gulf shoreline erosion rates measured over the past 70 years by the University of Texas Bureau of Economic Geology.*

COASTAL PROJECTS IN THE CYCLE 8 BIENNIUM

Construction Projects

GIWW-Rollover Bay Reach Beach Nourishment with Beneficial Use of Dredged Material (BUDM) FY2014 event (1584-BMMP maintenance project)

Partner(s): U.S. Army Corps of Engineers, Galveston County
Type: Beach Nourishment
Budget: $5,238,460
Location: Galveston County
CEPRA Share: $168,360

Project Description

Beach nourishment project beneficially utilizing approximately 173,000 cubic yards of material dredged from the fall 2013 U.S. Army Corps of Engineers maintenance dredging of the Gulf Intracoastal Waterway (GIWW) Rollover Bay Reach and placement along approximately 102,000 linear feet of Caplen Beach just west of Rollover Pass. Work was completed in early February 2014.

GIWW-Rollover Bay Reach Beach Nourishment with Beneficial Use of Dredged Material (BUDM) FY2015 event (1608-BMMP maintenance project)

Partner(s): U.S. Army Corps of Engineers, Galveston County
Type: Beach Nourishment
Budget: $5,795,020
Location: Galveston County
CEPRA Share: $197,500

Project Description

Beach nourishment project beneficially utilizing approximately 171,000 cubic yards of material dredged from the fall-winter 2014 U.S. Army Corps of Engineers maintenance dredging of the Gulf Intracoastal Waterway (GIWW) Rollover Bay Reach and placement along approximately 102,000 linear feet of Caplen Beach just west of Rollover Pass. Work was completed in mid-February 2015.

Galveston Seawall Beach Nourishment with Beneficial Use of Dredged Material West of 61st Street to 103rd Street (1609)

Partner(s):	**U.S. Army Corps of Engineers, Galveston County**
Type:	**Beach Nourishment**
Budget:	**$25,000,000**
Location:	**Galveston County**
CEPRA Share:	**$2,000,000**

Project Description

Beach nourishment project beneficially utilizing approximately 750,000 cubic yards of material dredged from the U.S. Army Corps of Engineers maintenance dredging of the Galveston Ship Channel and placement along the seawall beginning at 61st Street and continuing westward to 103rd Street. Work is scheduled for summer of 2015.

South Padre Island Beach Nourishment with Beneficial Use of Dredged Material (BUDM) FY2014 event (1574-BMMP maintenance project) and Regulatory Assistance

Partner(s):	**U.S. Army Corps of Engineers, City of South Padre Island**
Type:	**Beach Nourishment/Permitting Assistance**
Budget:	**BUDM event-TBD**
Location:	**Cameron County**
CEPRA Share:	**BUDM event-TBD; Regulatory Assistance: $33,899**

Project Description

Although the need for emergency dredging of the Brazos-Santiago jetty channel in April 2014 by the Corps precluded a beneficial use event in FY2014, a "regular" maintenance dredging event is anticipated around October-November 2015. The GLO anticipates partnering with the Corps for the nourishment of the gulf-facing beach along South Padre Island at Isla Blanca County Park and at the City of South Padre Island with beach-quality dredge material. Annual maintenance renourishment is a needed benefit in order to counter the ongoing erosion along the City's gulf-facing beach.

Regulatory Assistance: Engineering and regulatory services required to facilitate the amendment and extension of the City's existing U.S. Army Corps of Engineers Individual Project permit for the project, including a proposal to request USACE approval of two new near-shore dredge material disposal sites that would be utilized in the event dredge material could not be placed directly on the beach. Placement of material in these sites would facilitate the natural deposit of material onto the beach.

Arturo Galvan Coastal Park Living Shoreline Restoration (1576)

Partner(s):	**City of Port Isabel**
Type:	**Shoreline Protection**
Budget:	**$787,515**
Location:	**Cameron County**
CEPRA Share:	**$467,800**

Project Description

Shoreline protection project to construct a previously designed and permitted living shoreline project along approximately 2,000 feet of shoreline at the Arturo

Galvan Coastal Park adjacent to the Lower Laguna Madre within the City of Port Isabel. Work will consist of debris removal along the shoreline, shoreline earthwork grading, the construction of two small, low-crested rock breakwaters approximately 1,885 feet long in total, and marsh vegetation transplanting and seeding. The breakwaters will protect an inter-tidal area planted with native low marsh vegetation, in order to help reduce shoreline erosion and stabilize the project shore.

Keith Lake Fish Pass Baffle Marsh Restoration (1577)

Partner(s):	**Jefferson County**
Type:	**Marsh Restoration**
Budget:	**$5,102,000**
Location:	**Jefferson County**
CEPRA Share:	**$1,890,000**

Project Description

Project to modify the Keith Lake Fish Pass through the construction of a rock baffle in the middle of the fish pass to assist in providing conservation of the vast marsh south of the GIWW adjacent to state highway 87 in Jefferson County as one phase of a project to restore the hydrologic pattern of the marsh system to pre-development conditions. The baffle will reduce the cross section of the Keith Lake Fish Pass, so as to reduce the velocity of the water through the pass and thereby decrease the salinity within Keith Lake. The local project partner, Jefferson County, is taking the project lead and is responsible for overall execution of the project. Construction began in early January 2015.

Indianola Beach BMMP Beach Nourishment (1604)

Partner(s):	**Calhoun Port Authority**
Type:	**Beach Nourishment**
Budget:	**$237,600**
Location:	**Calhoun County**
CEPRA Share:	**$ 178,200**

Project Description

Maintenance re-nourishment in accordance with the GLO Beach Maintenance and Monitoring Plan of the Indianola Beach Nourishment and Shoreline Stabilization project on Matagorda Bay constructed under CEPRA Cycle 2 in 2003. Maintenance work is anticipated to be completed by fall 2015.

Bryan Beach Nourishment (1571)

Partner:	**Town of Quintana**
Type:	**Beach Nourishment**
Budget:	**$1,605,796.12**
Location:	**Brazoria County**
CEPRA Share:	**$702,000 (Cycle 7&8)**

Project Description

Bryan Beach is located in Brazoria County along the Gulf of Mexico shoreline to the west of the Freeport jetties. According

to surveys conducted in accordance with the BMMP during Cycle 8, Bryan Beach has experienced severe erosion and is in need of sand nourishment. The project will provide beach nourishment along Bryan Beach in accordance with the BMMP.

Rockport Beach Nourishment (1603)

Partner: Aransas County Navigation District
Type: Beach Nourishment
Budget: $429,500
Location: Aransas County
CEPRA Share: $379,500

Project Description

Rockport Beach is located in the western portion of Aransas Bay in Aransas County, Texas. According to surveys conducted in accordance with the BMMP during Cycle 8, Rockport Beach has experienced severe erosion and is in need of sand nourishment. The project will provide beach nourishment along Rockport Beach in accordance with the BMMP.

Dickinson Bayou Wetland Restoration (1572)

Partner: Texas Parks and Wildlife Department
Type: Wetland Restoration
Budget: $1,511,860
Location: Galveston County
CEPRA Share: $700,000

Project Description

Dickinson Bayou is located in Dickinson, Texas within Galveston County. The project would restore, enhance, and protect 17.7 acres of existing intertidal marsh, and create approximately 12.53 acres of intertidal marsh through beneficial use of material excaleted from approximately 32 acres of bay bottom in the main channel of Dickinson Bayou.

Virginia Point Wetland Protection and Restoration (1596)

Partner: Scenic Galveston
Type: Wetland Protection and Restoration
Budget: $3,575,000
Location: Galveston County
CEPRA Share: $675,000

Project Description

Virginia Point is located on the southwest side of Galveston Bay in Galveston County, Texas. The purpose of the proposed project is to construct near-shore segmented rock breakwaters parallel to the Virginia Point shoreline, extending down the shoreline approximately 10,000 feet.

The breakwaters would provide shoreline protection and enhance restored wetlands.

Magnolia Inlet Marsh Restoration (1591)

Partner: TAMU-AgriLife Research
Type: Marsh Restoration
Budget: $259,064
Location: Calhoun, County
CEPRA Share: $99,064

Project Description

Magnolia Inlet is located on the southwest side of Matagorda Bay in Calhoun County, Texas. This project would remove a portion of the blocked inlet to restore tidal flow and stop the erosion of interior wetlands and the adjacent shoreline. Portions of the removed material will be transported and used as living shoreline protection in Old Town Lake.

Oyster Lake Habitat Protection (1588)

Partner: Galveston Bay Foundation
Type: Habitat Protection
Budget: $500,000
Location: Brazoria County
CEPRA Share: $270,000

Project Description

Oyster Lake is located south of West Bay and west of the Freeport jetties in Brazoria County, Texas. The project consists of shoreline protection using Reef Balls (hard structures) to protect the shoreline by reducing erosion.

Innovative Technology Seaweed Prototype Dunes Demonstration Project (1581)

Partner: TAMU - Galveston
Type: Dune Study
Budget: $148,775
Location: Galveston County
CEPRA Share: $88,775

Project Description

The project is located on the Gulf of Mexico side of Apffel Park in Galveston County, Texas. The Study uses fresh sargassum that has been baled in a prototype hay baler as the base for engineered dunes. The dunes containing the sargassum bales are compared to dunes without bales to determine if the bales provide additional stability and promote vegetation growth on the outside of the dunes.

Mustang & NPI Beach Maintenance Impacts & Best Practices (1593)

Partner: TAMU – CC Harte Research Institute
Type: Beach Maintenance Study
Budget: $100,000
Location: Nueces County
CEPRA Share: $60,000

Project Description

Mustang Beach is located on the western shore of the Gulf of Mexico in Nueces County, Texas. This Study will identify effects of beach maintenance practices on beach and dune morphology as well as dune vegetation cover and diversity as they pertain to beach and dune stability. The primary outcome will be information on how to mitigate undesirable impacts of maintenance and improve the beach and dune habitat.

Non-Construction Projects

Feeder Beach at Follett's Island Phase 1 (1583)

Partner(s): Brazoria County
Type: Beach Nourishment
Budget: $462,500
Location: Brazoria County
CEPRA Share: $337,500

Project Description

Data collection, permitting and final engineering design phase (Phase 1) of a three-phase beach nourishment demonstration project. If constructed in a future funding biennium, this phase of the project would facilitate the construction of a feeder beach along the gulf-facing shoreline of Follett's Island from the western limit of the Treasure Island community extending approximately one mile south and west, utilizing an area inside San Luis Pass as a sand borrow source.

North Jetty Sand Search Investigation (1585)

Partner(s): Galveston County
Type: Study-Sand Source Investigation
Budget: $760,000.75
Location: Galveston County
CEPRA Share: $250,000

Project Description

Joint CEPRA-CIAP funded sand source study to develop a potential sediment inventory and volume determination of the Bolivar Roads Houston-Galveston Ship Channel north jetty area adjacent to Bolivar Peninsula and amend an existing USACE permit to incorporate potential borrow site(s). The local project partner, Galveston County, is taking the project lead and is responsible for overall execution of the project.

Moses Lake Shoreline Protection Phase 3 & Dollar Bay Marsh Restoration (1592)

Partner(s):	**Galveston Bay Foundation**
Type:	**Shoreline Protection & Marsh Restoration**
Budget:	**$760,000.75**
Location:	**Galveston County**
CEPRA Share:	**$250,000**

Project Description

Follow-up phased shoreline protection and marsh restoration project to the Moses Lake Shoreline Protection Phase 2 project. The project scope involves data collection, permitting and final engineering design. If constructed in a future funding biennium, the project would protect up to 4,000 linear feet of shoreline and adjacent habitat along the north shoreline of Moses Lake and restore an estimated 30 acres of degraded wetland habitat in Dollar Bay. The local project partner, Galveston Bay Foundation, is taking the project lead and is responsible for overall execution of the project.

Projects Funded Using Cycle 7 Funds but not Included in the Previous Report

West Galveston Island Bayside Marsh Restoration (1601)

Partner:	**Texas Parks and Wildlife Department**
Type:	**Wetland Habitat Restoration**
Budget:	**$4,900,398**
Location:	**Galveston County**
CEPRA Share:	**$50,000**

Project Description

The project is located in Galveston County adjacent to Galveston Island in West Bay. Erosion and subsidence along West Galveston Bay shorelines have resulted in habitat and marsh loss. From the mid-1950s to 2002, the amount of estuarine marsh in West Galveston Bay has decreased by 32 percent, estuarine tidal flats have declined by 61 percent, and palustrine marshes have decreased by 50 percent.

The project will protect approximately 181 acres of existing coastal wetlands through the construction of a breakwater protecting them from continued erosion and the restoration of approximately 85 acres of estuarine marsh complex.

Nueces River Delta Stabilization & Habitat Protection (1528)

Partner:	**CBBEP**
Type:	**Shoreline Protection**
Budget:	**$322,500**
Location:	**San Patricio and Nueces counties**
CEPRA Share:	**$193,500**

Project Description

The Nueces River Delta is located in San Patricio and Nueces counties, 20 miles northwest of downtown Corpus Christi and three miles southwest of the City of Odem. It covers land between Highway 77 (the delta's western boundary) and the back end of Nueces Bay (the delta's eastern boundary).

The western-most shoreline of Nueces Bay is rapidly eroding the habitat of the Nueces River Delta, with a documented erosion rate of 8.2 feet per year. This project will protect the delta's wetland habitat by constructing a protective structure in the waters of Nueces Bay. This project will stabilize the eroding shoreline, thereby protecting thousands of acres of diverse coastal marsh and prairie habitat and living resources that lie behind the shoreline.

McGee Beach Nourishment (1605)

Partner: City of Corpus Christi
Type: Beach Nourishment
Budget: $269,000
Location: Nueces County
CEPRA Share: $5,000

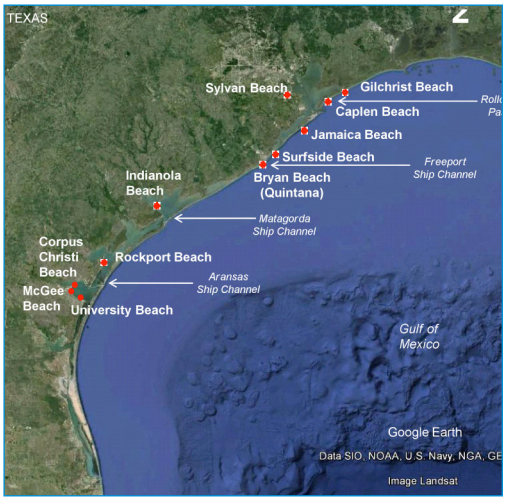
Project Description

McGee Beach is located in Nueces County along the northern shoreline of Corpus Christi Bay. According to surveys conducted in accordance with the Beach Monitoring and Maintenance Plan (BMMP) during Cycle 7, Corpus Christi Beach has experienced severe erosion and is in need of sand nourishment. The project will provide beach nourishment along McGee Beach in accordance with the BMMP.

Preliminary Engineering, Studies and Data Collection

Beach Monitoring and Maintenance Surveys (1602)

Partner: None – GLO Project
Type: Data Collection
Budget: $364,173
Location: Coastwide
CEPRA Share: $364,173



Project Description

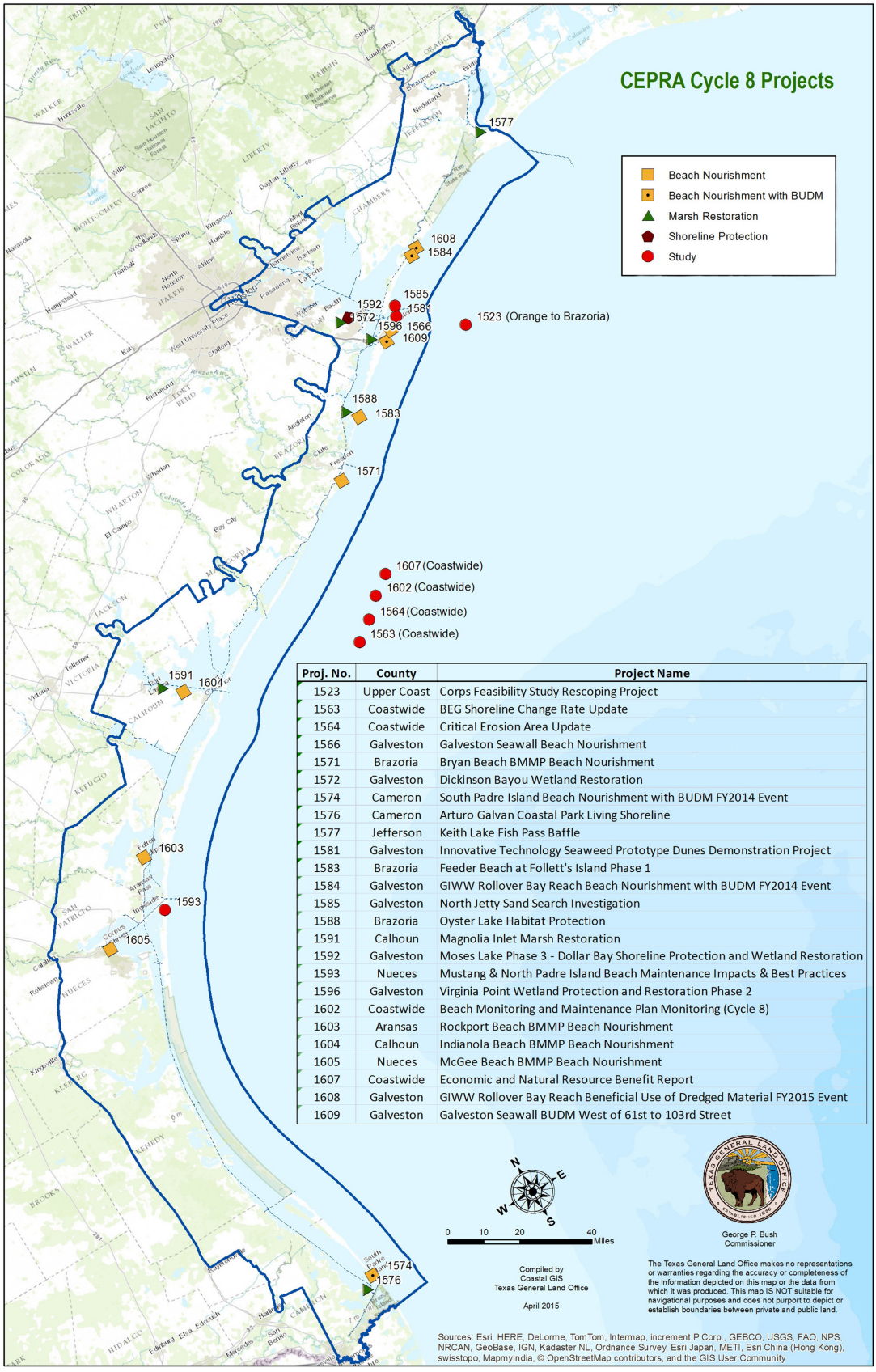
According to FEMA, a BMMP is a prerequisite for receiving funding under the Public Assistance (PA) program for the mitigation of damages to engineered beaches impacted by federally declared disasters. In order to meet FEMA requirements, the GLO completed the BMMP in June 2010. In accordance with FEMA requirements, pre- and post-storm surveys will be used to determine the eligible volume of sand. Survey data are now collected annually to measure sand loss/gain at each engineered beach. In addition, surveys are typically conducted prior to the corresponding hurricane season. This project conducted annual surveys of 13 beaches during Cycle 8.

Economic and Natural Resource Benefits of CEPRA Cycle 7-8 Projects (1607)

Partner:	**None – GLO Project**
Type:	**Study**
Budget:	**$190,000**
Location:	**Coastwide**
CEPRA Share:	**$190,000**

Project Description

The CEPRA statute requires the Land Commissioner to evaluate the natural resource and economic benefits of CEPRA projects and report these measured benefits to the Texas Legislature for each biennium that the Legislature provides CEPRA funding. This study quantified the economic benefits associated with CEPRA Cycle 6 and Cycle 7 construction projects, including calculation of storm damage reduction benefits. It also provided an evaluation of natural resource improvements associated with habitat restoration and protection projects using established methodologies. An executive summary of the findings can be reviewed in the Economic and Natural Resources Benefits section in this report.



Proj. No.	County	Project Name
1523	Upper Coast	Corps Feasibility Study Rescoping Project
1563	Coastwide	BEG Shoreline Change Rate Update
1564	Coastwide	Critical Erosion Area Update
1566	Galveston	Galveston Seawall Beach Nourishment
1571	Brazoria	Bryan Beach BMMP Beach Nourishment
1572	Galveston	Dickinson Bayou Wetland Restoration
1574	Cameron	South Padre Island Beach Nourishment with BUDM FY2014 Event
1576	Cameron	Arturo Galvan Coastal Park Living Shoreline
1577	Jefferson	Keith Lake Fish Pass Baffle
1581	Galveston	Innovative Technology Seaweed Prototype Dunes Demonstration Project
1583	Brazoria	Feeder Beach at Follett's Island Phase 1
1584	Galveston	GIWW Rollover Bay Reach Beach Nourishment with BUDM FY2014 Event
1585	Galveston	North Jetty Sand Search Investigation
1588	Brazoria	Oyster Lake Habitat Protection
1591	Calhoun	Magnolia Inlet Marsh Restoration
1592	Galveston	Moses Lake Phase 3 - Dollar Bay Shoreline Protection and Wetland Restoration
1593	Nueces	Mustang & North Padre Island Beach Maintenance Impacts & Best Practices
1596	Galveston	Virginia Point Wetland Protection and Restoration Phase 2
1602	Coastwide	Beach Monitoring and Maintenance Plan Monitoring (Cycle 8)
1603	Aransas	Rockport Beach BMMP Beach Nourishment
1604	Calhoun	Indianola Beach BMMP Beach Nourishment
1605	Nueces	McGee Beach BMMP Beach Nourishment
1607	Coastwide	Economic and Natural Resource Benefit Report
1608	Galveston	GIWW Rollover Bay Reach Beneficial Use of Dredged Material FY2015 Event
1609	Galveston	Galveston Seawall BUDM West of 61st to 103rd Street

CYCLE 7 PROJECT ALLOCATIONS AND EXPENDITURES

Project Number	Project Name	County	Project Type	CEPRA Allocation	CIAP Allocation	FEMA PW Allocation	Local Allocation	Federal Allocation (other)	Total Project Cost	Total Expenditure
1523	Sabine Pass to Galveston Bay, TX Feasibility Study	Coastwide	SM	$698,240				$606,821	$1,305,061	$10,419
1530	McFaddin NWR Beach Ridge Restoration	Jefferson	BN	$1,000,000	$4,800,227		$100,000		$5,900,227	$0
1519	GIWW Rollover Bay Reach Beach Nourishment with Beneficial Use of Dredged Material	Galveston	BN	$48,575			$16,192	$3,332,816	$3,397,582	$64,766
1566	Galveston Seawall Beach Nourishment	Galveston	BN	$500,000		$15,009,960	$600,398		$16,110,358	$0
1521	End of Seawall Beach Nourishment	Galveston	BN	$775,000		$2,826,168	$426,059		$4,027,227	$418
1522	End of Seawall Resen Waves Beach Stabilization Demonstration Project	Galveston	SP	$329,987					$329,987	$1,415
1568	West Galveston Island Shoreline Stabilization Demonstration	Galveston	SM	$1,000,000					$1,000,000	$0
1531	Green's Lake Shore Protection and Marsh Restoration	Galveston	SP	$34,722			$23,147		$57,869	$0
1482	Jamaica Beach Dune Restoration	Galveston	DR	$50,000		$1,963,008	$142,758		$2,155,766	$0
1520	Bird Island Cove Marsh Restoration	Galveston	HR	$410,000			$200,000	$1,060,000	$1,670,000	$0
1529	County Road 257 Dune Restoration	Brazoria	DR	$1,700,000	$2,100,000				$3,800,000	$0
1570	Surfside Beach Nourishment	Brazoria	BN	$1,910,000					$1,910,000	$0
NA	Surfside Revetment Repair	Brazoria	SP	$1,041,298					$1,041,298	$0
1571	Bryan Beach Nourishment	Brazoria	BN	$75,000					$75,000	$0

CYCLE 7 PROJECT ALLOCATIONS AND EXPENDITURES (CONT'D)

Project Number	Project Name	County	Project Type	CEPRA Allocation	CIAP Allocation	FEMA PW Allocation	Local Allocation	Federal Allocation (other)	Total Project Cost	Total Expenditure
1532	Sargent Beach Nourishment	Matagorda	DR	$1,500,000				$2,297,096	$3,797,096	$0
1527	Indian Point Shoreline Stabilization & Habitat Protection	Nueces	SP	$450,000			$300,000		$750,000	$0
1565	Nueces Bay Portland Causeway Marsh Restoration	Nueces	HR	$475,000	$2,339,000			$100,000	$2,914,000	$0
1528	Nueces River Delta Stabilization & Habitat Protection	Nueces	SP	$112,500			$75,000		$187,500	$0
1569	Corpus Christi Beach Nourishment	Nueces	BN	$2,340,000					$2,340,000	$0
1524	South Padre Island Beach Nourishment with the Beneficial Use of Dredged Material	Cameron	BN	$0	$1,165,235	$388,412		$2,084,000	$3,637,646	$1,491,646
1525	Isla Blanca Park Beach Nourishment with the Beneficial Use of Dredged Material	Cameron	BN	$48,000			$16,000		$64,000	$0
1535	Beach Monitoring and Maintenance Plan Monitoring Surveys Cycle 7	Galveston	BN	$48,575			$16,192	$3,332,816	$3,397,582	$64,766
1562	Economic and Natural Resource Benefits of CEPRA Cycle 6-7 Projects	Coastwide	SM	$161,121					$161,121	$0
1563	Update of Critical Erosion Rates for the Texas Gulf Coast	Coastwide	SM	$100,000					$100,000	$0
1504	Effects of Hurricane Ike, Phase II & III	Coastwide	SM	$56,290					$56,290	$55,803
NA	FEMA PW Management	Coastwide	SM	$180,989					$180,989	$180,989
	Totals			$15,256,290	$10,404,461	$19,799,136	$2,287,965	$9,480,733	$57,228,586	$1,916,941

CYCLE 8 PROJECT ALLOCATIONS AND EXPENDITURES

Project Number	Project Name	County	Project Type	CEPRA Allocation	CIAP Allocation	FEMA HB 4586 Allocation	FEMA PW Allocation	Local Allocation (other)	Federal Allocation	Total Project Cost	Total Expenditure
1563	BEG Erosion Rate Update	Statewide	Study	$95,000						$95,000	
1564	Critical Erosion Area Update	Galveston	DR	$33,000						$33,000	
1572	Dickinson Bayou Wetland Restoration	Galveston	SP /MR	$700,000					$1,500,000	$1,511,860	
1576	Arturo Galvan Coastal Park Living Shore	Cameron	SP/MR	$467,800				$100,000	$219,715	$787,515	
1577	Keith Lake Fish Pass Baffle	Jefferson	MR	$1,890,000				$312,000		$5,102,000	
1581	Innovative Technology Seaweed Prototype Dunes Demonstration Project	Galveston	DR /SP	$88,775				$60,000		$148,775	
1583	Follet's Island Feeder Beach Phase 1	Brazoria /BUDM	BN	$337,500					$125,000	$462,500	
1584	GIWW Rollover Bay Reach BN/BUDM	Galveston	BN /BUDM	$168,360				$49,500	$5,040,100	$5,238,460	
1585	North Jetty Sand Search Investigation	Galveston /MR	SP	$250,000				$15,000	$495,001	$760,001	
1588	Oyster Lake Habitat Protection	Brazoria	SP /MR	$270,000				$230,000		$500,000	
1591	Magnolia Inlet Marsh Restoration	Calhoun /MR	SP	$99,064					$160,000	$259,064	
1592	Moses Lake - Dollar Bay Shoreline Protection and Wetland Restoration	Galveston /MR	SP	$101,250				$75,000		$176,250	
1593	Mustang & NPI Beach Maintenance Impacts & Best Practices	Nueces	Study	$60,000				$40,000		$100,000	
1596	Virginia Point Wetland Protection and Restoration Phase 2	Galveston /MR	SP	$675,000	$1,000,000			$100,000	$1,000,000	$3,575,000	
1602	BMMP	Statewide	Study	$364,173						$364,173	

CYCLE 8 PROJECT ALLOCATIONS AND EXPENDITURES (CONT'D)

Project Number	Project Name	County	Project Type	CEPRA Allocation	CIAP Allocation	FEMA HB 4586 Allocation	FEMA PW Allocation	Local Allocation (other)	Federal Allocation	Total Project Cost	Total Expenditure
1603	Rockport Beach Beach Nourishment	Aransas	BN	$379,500				$50,000		$4,295,000	
1604	Indianola Beach Beach Nourishment	Calhoun	BN	$178,200				$59,400		$237,600	
1605	McGee Beach Nourishment	Nueces	BN	$5,000				$264,000		$269,000	
1607	Economic and Natural Resource Benefit-Cost Study	Nueces	Study	$190,000						$190,000	
1608	GIWW Rollover Bay Reach BN/BUDM	Galveston	BN /BUDM	$157,500				$52,500	$4,390,000	$4,600	
1609	Galveston Seawall BUDM West of 61st to103rd Street	Galveston	BN /BUDM	$2,000,000				$6,990,000	$16,010,000	$25,000,000	
	Totals			$8,510,122	$1,000,000		$0	$8,397,400	$28,939,816	$49,109,798	

ECONOMIC AND NATURAL RESOURCES BENEFITS OF THE CEPRA PROGRAM

Texas' coastal assets, including infrastructure, industry, public and private property, beaches, dunes, wetlands, marshes, and parks, provide significant economic value for the Texas citizenry. Natural and man-made activities, such as storms or cuts in barrier islands, and their subsequent consequences of erosion and increased damage to property and infrastructure adversely affect these coastal assets. The Texas Legislature requires the GLO to report the economic and natural resource benefits derived from CEPRA construction projects every biennium. As such, the GLO contracted Taylor Engineering, Inc. to perform the benefit-cost analyses for selected Cycle 6 – 8 construction projects, which is a representative sampling of the CEPRA program. The study reported that the state of Texas received $3.40 in economic and financial benefits for every dollar of state funding invested in these projects. This result is based on analysis of the following five CEPRA Cycle 6 – 8 projects, which is a representative sampling of the CEPRA program:

- #1382 CR257 Road Repair and Protective Revetment (Cycle 6)
- #1463 Port Aransas Nature Preserve Shoreline Protection Repair (Cycle 6)
- #1532 Sargent Beach Nourishment (Cycle 7)
- #1565 Nueces Bay Portland Causeway Marsh Restoration(Cycle 7)
- #1584 GIWW Rollover Bay Reach Beach Nourishment w/Beneficial Use of Dredged Material (BUDM) FY2014 event (Cycle 8)

The project benefits analyses classified and estimated economic and financial benefits associated with commercial and recreational fishing, tourism and ecotourism (wildlife viewing), improved water quality, carbon sequestration, beach recreation, out-of-state visitor spending, non-Texas project funding, and storm protection. The stream of economic benefits over time varied from project to project depending on a project's durability. The period of analysis for the various projects varied from 1 to 30 years.

The study adopted a Texas accounting perspective. Funding from outside Texas and spending by visitors from outside the state represent financial benefits to the state. A Texas accounting perspective views project contributions normally considered a cost when viewed from a national or world perspective as a financial benefit. Costs funded by non-Texas dollars represent a financial benefit because money flows into the Texas economy. As appropriate, the findings reported show this adjustment to reflect the Texas accounting perspective for the estimates of benefits and costs. The report served to estimate

the cost effectiveness of the five projects listed above via benefit-to-cost ratios and net benefits on an individual project basis, and as a group, or "portfolio." Notably, by excluding spending by Texas residents, this study provided conservative estimates of benefits for each individual project yet provided a reasonable estimate of the benefits that CEPRA construction projects bring to the state of Texas as a whole.

The table below presents a summary of the assessed projects. The direct and positive net benefits (B/C ratios greater than one) from the five evaluated projects combined indicate that these coastal erosion control projects yield high returns on investment for the state of Texas. Preserving Texas' coastal assets proves a worthy public investment strategy for Texas taxpayers and citizens.

Notably, the leveraging of federal participation played a substantial role for several projects. For example, the low Texas cost of the shoreline protection at Port Aransas Nature Preserve reflects contributions from the Federal Emergency Management Agency (FEMA) Public Assistance program, which covered 90 percent of the total project costs.

SUMMARY OF CEPRA CYCLE 6 - 8 PROJECTS, COSTS AND BENEFITS

Project Number	Project Name	County	Year	Texas Cost[1]	Total Discounted Cost[2]	Total Discounted Benefits[2]	Benefit-to-Cost (B/C) Ratio
1382	CR257 Road Repair and Protective Revetment	Brazoria	2013	$7,387,294	$8,133,580	$35,725,771	4.4
1463	Port Aransas Nature Preserve Shoreline Protection Repair	Nueces	2013	$256,146	$273,119	$2,149,845	7.9
1532	Sargent Beach Nourishment	Matagorda	2013	$3,796,450	$4,048,013	$456,499	0.1
1565	Nueces Bay Portland Causeway Marsh Restoration	San Patricio/ Nueces	2013	$753,957	$803,916	$6,785,741	8.4
1584	GIWW-Rollover Bay Reach Beach Nourishment with BUDM (2014 Event)	Galveston	2014	$198,360	$204,827	$30,895	0.2
	Totals			**$12,392,207**	**$13,463,455**	**$45,148,750**	**3.4**

[1] Texas portion only; Dollar values reflect present worth equivalents at the beginning of the year of project construction

[2] Dollar values reflect present worth equivalents at the beginning of 2015 with a 3.26% discount rate; Total Discounted Cost = Texas Cost * 1.0326 (2015 - y), where y = Project Year.

As another example, the low Texas cost of the beach nourishment near Rollover Pass reflects the substantial cost savings from partnership with the U.S. Army Corps of Engineers (USACE) for the beneficial use of dredged material. This project placed beach fill at an effective unit cost of $1.15 per cubic yard (cy) of beach fill, far below typical industry costs; however, the low benefit-to-cost ratio reflects the project area's relatively low property values and visitation rates compared to more popular tourist destinations (e.g., Galveston Island and South Padre Island beaches). Additionally, the benefit-to-cost ratio of this beach nourishment project does not include federal spending as a benefit, because the federal dredging project would occur even without the beach nourishment; thus the benefits presented in the table on page 22 solely reflects the project's visitation, recreation, and/or storm damage protection benefits.

Federal spending on CEPRA projects is also important from a Texas point of view because it reflects financial inflows to the state economy and lowers project costs to Texas. Several of the evaluated projects realized these benefits. The Port Aransas Nature Preserve Shoreline Protection Repair Project experienced federal spending benefits ($1,091,992 discounted present worth) from FEMA funding as mentioned above. Similarly, Nueces Bay Portland Causeway Marsh Restoration experienced federal spending benefits ($2,374,233 discounted present worth) from funding by the U.S Fish & Wildlife Service, National Oceanic and Atmospheric Administration, and the Coastal Impact Assistance Program (CIAP). The 1382 CR257 Road Revetment Project experienced federal spending benefits ($14,306,805 discounted present worth) from the Federal Highway Administration and CIAP.

As a final note, the annual discount rate of 3.26 percent represents an average of 20-year AAA and AA corporate bond rates existing at the time of study initiation. The discount rate is used to convert values occurring at different points in time to comparable equivalent values ("discounted present worth") at a common point in time, which in Table 4 is the beginning of 2015.

ASSESSMENT OF NEEDS

Each biennium, the CEPRA program receives applications for funding for various types of projects along the Texas coast. These projects may include beach/dune nourishment, marsh restoration, shoreline protection, structure relocation, debris removal, and other types of projects. However, due to limited funding many projects do not receive funding during the biennium. Table 7 includes projects that applied for but did not receive CEPRA funding during Cycle 7.

CYCLE 8 UNFUNDED PROJECT APPLICATIONS

Submitting Organization	Project Name & Type	County	CEPRA Funding Requested	Local Match	Federal Funding	Percent Federal/ CEPRA Funding	Estimated Total Project Cost
Ducks Unlimited	Green's Lake Shoreline Protection & Marsh Restoration Phase 2 Restoration Project	Galveston	$1,145,700	$0	$763,800	66.7%	$1,909,500
Aransas County	Cedar Bayou –Vinson Slough Restoration	Aransas	$2,375,404	$4,800,173	$262,322	11.0%	$7,437,899
Galveston Bay Foundation	Gordy Marsh. Marsh Restoration & Shoreline Protection Phase 1	Chambers	$375,000	$70,000	$180,000	48.0%	$625,000
The Nature Conservancy	Shamrock Island Habitat Protection & Enhancement Phase 2	Nueces	$1,114,080	$742,720	$0	0.0%	$1,856,800
Calhoun County	Port Alto Beach Sediment Management	Calhoun	$101,250	$33,750	$0	0.0%	$135,000

CYCLE 8 UNFUNDED PROJECT APPLICATIONS (CONT'D)

Submitting Organization	Project Name & Type	County	CEPRA Funding Requested	Local Match	Federal Funding	Percent Federal/ CEPRA Funding	Estimated Total Project Cost
Port of Port Arthur Navigation District	Port of Port Arthur Shoreline Protection	Jefferson	$835,904	$835,904	$0	0.0%	$1,671,808
Cameron County	Adolph Thomae Jr. County Park Shoreline Restoration Phase 3	Cameron	$470,280	$108,520	$205,000	43.6%	$783,800
City of Corpus Christi	Cole Park Shoreline Protection	Nueces	$1,200,000	$800,000	$0	0.0%	$2,000,000
Galveston County	Engineering Analysis of Submerged Structures	Galveston	$275,000	$15,000	$409,913	149.1%	$699,913
University of Texas Bureau of Economic Geology	Identifying and Evaluating Onshore Sand Sources Using Airborne and Ground Geophysics	Matagorda /Brazoria	$220,961	$150,018	$0	0.0%	$370,979
University of Houston and Galveston Park Board of Trustees	Galveston Island Tourism Development Beach User Surveys	Galveston	$44,264	$29,510	$0	0.0%	$73,774
Texas A&M Galveston	Galveston & Follet's Island Beach Monitoring Program	Galveston /Brazoria	$450,000	$0	$0	0.0%	$450,000
Galveston Park Board of Trustees	Sand Management Plan for Galveston Island	Galveston /Brazoria	$165,000	$110,000	$0	0.0%	$275,000
Totals			$8,772,843	$7,695,594	$1,821,035		$18,289,473

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